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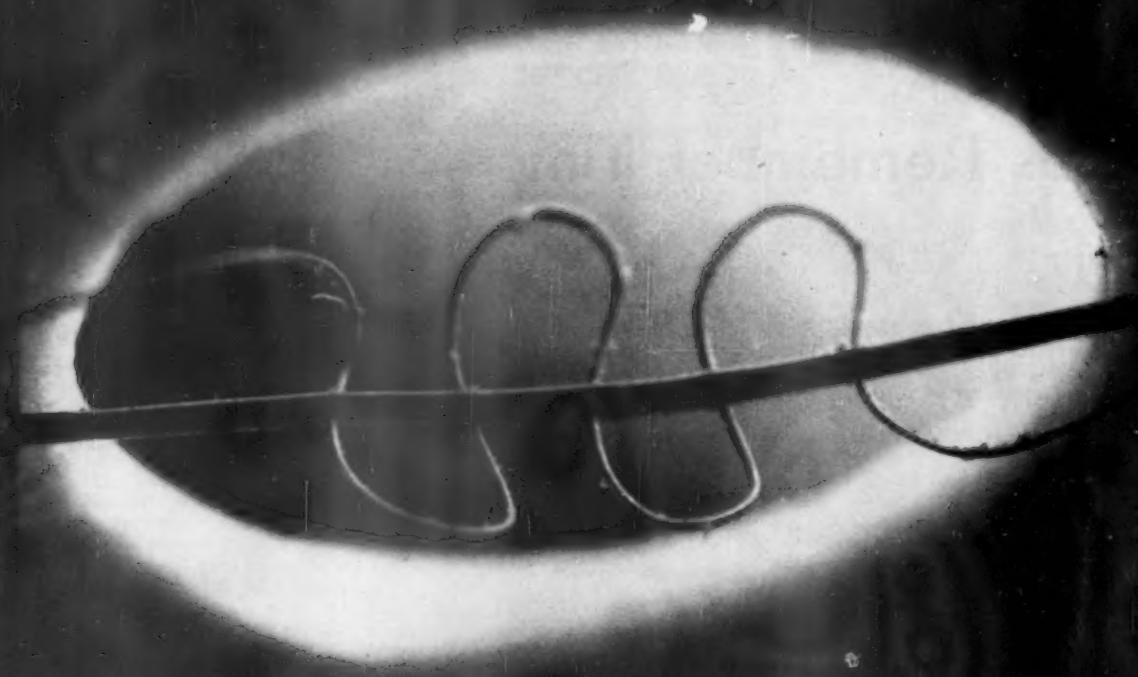
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Threaded Hair

See Page 34

A SCIENCE SERVICE PUBLICATION

PSYCHOLOGY

Learning While Asleep

➤ CAN YOU learn a foreign language while you are asleep?

The verdict of "not proved" was the conclusion of psychologists Drs. Charles W. Simon and William H. Emmons of the RAND Corporation, research organization for the Air Force. They reported their verdict to the *Psychological Bulletin* (July).

Their conclusion supports the personal opinion of college professors that it helps if the students stay awake.

Only ten scientific studies of learning while asleep have been made, of which only three have been published, the psychologists reported. Five were academic theses.

Chief fault the psychologists found with the research studies was in not making sure that the subjects were really asleep. In four of the studies, the experimenter asked the subject after his training whether he had awakened. This is not satisfactory evidence of sleep.

It is a common experience, the reviewers pointed out, for a person to awaken during the night, perform a number of rational acts before retiring again, and yet remember nothing of it the next day.

Two of the experimenters asked the subjects if they were asleep before proceeding with the training. Two asked the subjects to press a button whenever they woke up. In two of the studies, however, the experimenter did not even remain with the subject to note whether he looked asleep.

All ten studies were found to have weaknesses in experimental design, statistical method, or criteria of sleep.

It is doubtful whether any of the studies produced any acceptable evidence that learning during sleep is possible, the scientists concluded. The tests tend to show that learning may take place in a special kind of waking state where the subjects do not remember that they have been awake.

Future research may conclusively show, the scientists suggested, whether it is really possible to learn during sleep and also may provide comparative data between wide-awake and resting learning.

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ENTOMOLOGY

Bees Remember Time

➤ PARISIAN BEES trained to feed at a regular hour in their Paris home showed up right on schedule for their sugar water meal in New York. (See SNL, June 25, p. 405.)

In spite of the time lag between Paris and New York, the bees flown from Paris kept to their previous 24-hour feeding cycle.

To Dr. Max Renner of the University of Munich who is conducting the experiment, this supports the idea that bees have a kind of internal "clock" or time control.

If the bees had changed their feeding time after the flight across the ocean, then it would have seemed that external factors, like the position of the sun, controls the bees' "time memory." This was not the case, however.

In the laboratory at the American Museum of Natural History in New York, the bees fed from 3:15 to 5:15 p.m. This corresponds to 8:15 to 10:15 p.m. Paris time, the hours the bees were trained to feed.

Final conclusions cannot be drawn, however, until a similar experiment is completed in Paris, Dr. Renner said.

For the second half of the experiment, a new group of bees was trained in New York to feed from 1:30 to 3:30 p.m., New York time. The bees have been flown back to Paris, to see if they keep to the New York feeding schedule.

Dr. Theodore C. Schneirla, curator of the museum's department of animal behavior, said that this research on bees ties in with similar work going on over the world to learn how plants and animals carry out cyclic activities, like the daily opening and closing of flowers or the routine feeding behavior of many animals.

When better understood, this knowledge of cyclic behavior should have many applications from controlling plant growth to helping man carry out his own cyclic activities without specific external timing devices, Dr. Schneirla said.

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TECHNOLOGY

Drill Holes in Hair, And Thread With Wire

See Front Cover

➤ INSTRUMENT MAKERS are now doing better than splitting hairs. They drill holes in human hair and thread them with fine wires. One hair so treated is shown on the cover of this week's SCIENCE NEWS LETTER.

A drill of one mil, or one-thousandth of an inch, makes the invisible holes. The drill is so delicate it could be snapped or bent by accidental contact with paper tissue.

It takes a microscope and a steady hand to thread the tiny hole. The microscopic drill is used by General Electric's General Engineering Laboratory to make tiny fuel injection nozzles, orifices in leak disks that control the flow of gas into a vacuum chamber, and apertures for electron beams in sensitive X-ray equipment.

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MEDICINE

Cancerous Moles Spotted By Radioactivity Test

➤ WHETHER OR not a mole is malignant can be determined by a simple radioactivity test developed by doctors of the University of California at Los Angeles Medical Center and the Los Angeles Veterans Administration Hospital.

Drs. Franz Bauer and Charles Steffen reported the new procedure in the *Journal of the American Medical Association* (July 9).

A small, harmless amount of radioactive phosphorus is intravenously injected into a patient having a mole suspected of being malignant. Three hours later a special Geiger counter is passed over the mole and tissue surrounding the mole, and the radioactivity measured.

Rapidly growing cells such as those in cancer take up more radiophosphorus than normal tissue. Thus if the mole is malignant, the radioactivity will be higher in the mole than in surrounding normal tissue.

More than 70 cases have been studied with the new procedure. In all cases, moles that showed a significant increase in radioactivity proved to be cancerous.

Although the new procedure is thought to be an effective diagnostic tool, the radiophosphorus used does not emit strong enough radiation for treatment of malignant moles, the doctors said. They emphasized that the procedure does not replace a biopsy, but makes the physician malignancy-conscious and guides him concerning the extent of necessary surgery.

Science News Letter, July 16, 1955

PUBLIC SAFETY

Teen-Age Girls Drive Better Than Boy Friends

➤ TEEN-AGE GIRL drivers get into fewer fatal automobile accidents than teen-age boys, but they both get into an "unduly high proportion" of fatal collisions, a study at Iowa State College showed.

Fifteen times as many men and four times as many women under 19 had fatal accidents in Iowa last year as would be expected from their general accident record, Dr. A. R. Lauer, director of the college's driving laboratory, found.

The Iowa study showed that in the 20 to 24 age group there was not only a sharp drop but a marked deficiency of fatality drivers among men. The ratio of fatal to reported accidents was found to rise gradually with age after 24, but it does not become significantly out of proportion until the age of 75.

For women, the proportion of fatal accidents remains about constant after 20. It is significantly higher below 19 and significantly lower at about age 50, the report said.

Provisional licenses for persons up to the age of 21 was suggested. After 21, regular permits would be issued if the driving records are satisfactory.

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PUBLIC HEALTH

Life's Radiation Tallied

Dr. W. F. Libby, tabulating the amounts of natural radioactivity and cosmic ray dosages affecting humans, found that seafarers receive less than landlubbers.

➤ THE INTREPID mariner receives less natural atomic radiation than does his landlubber brother, Dr. W. F. Libby, a member of the atomic Energy Commission, reported in *Science* (July 8).

Dr. Libby made a statistical analysis of the radiation dosages people receive from natural radioactivity and cosmic rays. His tabulations showed that earth dwellers are absorbing natural atomic radiation daily from their neighbors and their surroundings.

People, packed in a crowd, for instance, receive radioactivity from the potassium in their neighbors' bodies at the rate of two milliroentgens per year. However, this does not mean that people are poisonous to other people on account of radiation.

Dr. Libby pointed out that altitude and environment play an important role in the amount of natural radiation man is exposed to.

"It is interesting," he stated, "that the variations in natural dosage are large and under certain conditions the natural dosage may be nearly 100 times higher than the minimum, the dosage of seafarers."

A seafarer on the open ocean at the equator is subjected to an average of 53 mr/yr (milliroentgens per year), whereas the same voyager at a latitude of 55 degrees north, or about Moscow's latitude, absorbed 57 mr/yr. At sea level at 55 degrees north, there was an average of 147 mr/yr, and at 20,000 feet, 560 mr/yr.

Dr. Libby also pointed out that the biological effects per unit energy may be larger for cosmic radiation, because it consists of high-energy particles rather than gamma radiation.

Wearing 24 hours a day a wrist-watch that has a luminous dial would give the central body, including the sex organs, a dosage of 40 mr/yr.

In making a list of other types of exposure that occur in normal living, the AEC commissioner listed each X-ray of the lumbar spine, lateral, as giving a dosage of 5,700 mr/yr; uranium ore on the ground, 2,800 mr/yr; a uranium mine with all walls of ore, 5,600, and phosphate rock fertilizer on the ground, 280 to 700.

Humans also take in radiation when they drink water. Radium is assimilated in drinking waters throughout the normal lifetime, Dr. Libby said, and radium in the bones gives off 6.7 mr/yr.

Dr. Libby listed direct measurements made as background count in human environments. In the streets of Stockholm, the total cosmic ray and gamma radiation count was from 121 to 150 mr. In wood houses it was 104, in brick and concrete homes from 145 to 296. Outdoors in Brookhaven, N. Y., the count was 98, and 90 on Fordham University's campus.

The fallout dosage from atomic tests on Jan. 1, 1955, Dr. Libby reported, was about 1 mr/yr, with the total dose during 1954 estimated at about 15 mr "principally because of the Pacific tests in the spring."

All these figures fall far below the roentgens that must be absorbed by the body to bring on sickness or death. To bring about radiation sickness, 100,000 or more milliroentgens in one dose would be necessary.

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AERONAUTICS

Double-Rotor Helicopter Adapted for Civil Use

➤ FAST, LONG-RANGE helicopter "bus" service is seen a step nearer reality with the announcement that the military twin-rotor H-21 "Work Horse" helicopter has been adapted for commercial use.

The civil version, scheduled for initial delivery by the Piasecki Helicopter Corporation in 1956, will be known as the PH-42. The powerful "whirlybird," which cruises at 98 miles an hour, will seat from 16 to 19 passengers.

The "Work Horse" has demonstrated its ability to tow minesweeping gear and free trucks mired in the sand. The ship has a pulling force of from 6,000 to 8,000 pounds.

The body of the 'copter hangs between two large rotors, one at the front and one in the rear. The aircraft is described as particularly easy and safe in loading operations. Since the spinning blades clear the ground by 14 feet, personnel can walk near the helicopter in complete safety. Trucks can drive alongside for loading or unloading baggage.

New York Airways and Sabena Belgian Airlines are currently evaluating the PH-42 as a possible replacement for their present lower capacity helicopters. Civil Aeronautics Administration certification procedures on the "Work Horse" are under way.

The new helicopter will carry mail and baggage externally in a detachable "Helipack" under the fuselage, making additional cabin room for passengers. The outside baggage system will also speed loading and unloading and avoid doorway congestion.

The passenger cabin will be spacious as helicopter cabins go, measuring 20 feet long, nearly six feet high and over five and a half feet wide. Passengers may sit wherever they desire, since balance of the aircraft does not require special weight distribution in the cabin.

The company expects widespread use of the double-rotor helicopter in industry. It could carry 5,300 pounds of equipment in its stripped-down version, and could be used as a "flying crane" lifting loads up to 4,500 pounds. Its use is also foreseen in forest fire control, disaster evacuation, aerial mapping and photography, and meteorological observation.

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EASILY LOADED HELICOPTER—The rapidity and ease with which the commercial Piasecki PH-42 helicopter can be loaded is demonstrated by a military version of the same aircraft receiving cargo from a ton and a half category truck. The loading height of most trucks is within a few inches of the PH-42's door sill.

ANIMAL PHYSIOLOGY

Insomnia Bothers Sheep

➤ SHEEP, which some people count to fall asleep, do not sleep themselves. Nor do cows.

Part of the trouble seems to be that sheep and cows keep themselves awake because of their own cud chewing. To add to their sleepless plight, both groups of animals can lie down at night in a specified position only. Unlike humans with insomnia, sheep and cows cannot toss and turn, it is reported in *Nature* (May 28).

A study of the plight of these animals was made by Dr. C. C. Balch of the National Institute for Research in Dairying at the University of Reading, England. He reported that some cud-chewing animals have to keep their thorax in an upright position. In addition, the digestive habits of these animals depend to some degree on gravity, and tilting the organs the wrong way leads to trouble for the animals.

Sleepless nights are a characteristic of healthy adult cattle and sheep only, Dr. Balch found. If sleep does occur, he said, it is only of a very light nature.

Grazing animals frequently chew their cud for about nine hours out of every 24, and this ruminating is somewhat concentrated at night, Dr. Balch suggested. This led him to believe that the constant chewing and regurgitation have a disturbing effect on the animal.

Furthermore, Dr. Balch said, having to keep the head in the unsupported position found during the rumination period requires a good degree of consciousnes on the part of the animal.

Dr. Balch also pointed out that sleep in the horse is normal, noting that stabled horses in Germany were reported to have averaged seven hours sleep out of 24.

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METEOROLOGY

Drought Relief by 1957

➤ THE PREVAILING drought that has hit the Midwest since 1952 will end by 1957, Dr. Charles G. Abbot, former Secretary of the Smithsonian Institution, has predicted.

He also said that 60-year weather forecasts are now possible for any place in the country for which sufficiently detailed local records are available. These predictions would give general trends only, Dr. Abbot said, and might be wrong for particular years due to unforeseen factors such as volcanic eruptions and heavy bombings.

Dr. Abbot predicted the rainfall in St. Louis for 100 years, both backward and forward from 1897, then checked his forecasts against Weather Bureau records. For 70 out of 100 years, he came quite close to actual conditions.

He bases his predictions on 23 interacting weather cycles, requiring complicated statistical analysis of records. The pattern of these interacting cycles repeats itself about every 22 years, Dr. Abbot's studies have shown. Essentially the same pattern is found in fluctuations in the solar constant, Dr. Abbot believes.

The solar constant is the standard measure of the heat from the sun beating down on the top of the earth's atmosphere. Smithsonian scientists have measured it nearly every day for 35 years.

Variations in the solar constant are small, about one percent, and most meteorologists doubt that such small changes can have as much effect on the weather as Dr. Abbot believes.

Dr. Abbot pointed out that it is not necessary to assume that weather patterns and variations in the solar constant are related. The 23 periods, he said, "exist in temperature and precipitation, however they may be produced."

Nevertheless, Dr. Abbot believes that weather cycles depend directly on solar cycles, although solar effects on temperature and precipitation may be somewhat delayed in time.

Most meteorologists agree with Dr. Abbot that changes in the amount of solar heat received by the earth affect the weather, but they are not sure exactly how. Many of them are attacking the problem of solar effects on weather by various methods.

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MEDICINE

Twice Weekly Exercise Advised to Keep Fit

➤ MANY TRADITIONAL setting-up exercises, including touching your toes, are of little value if you want to keep muscles toned up and waistline trim.

However, the average adult can keep in good physical condition by means of two ten-minute sessions of exercise a week, according to Dr. Laurence E. Morehouse, professor of physical education at the University of California at Los Angeles and one-time adviser on physical fitness at West Point.

He emphasized that this does not mean 20 minutes a week of toe-touching, deep knee bends, arm waving and other traditional setting up exercises.

"Bending over and touching your toes," he points out, "actually does more harm than good. That is because such calisthenics stretch back muscles already stretched to flabbiness by constant sitting down."

A home exercise program recommended by Dr. Morehouse would include activities of this nature:

1. Vigorous warm-up exercise for several minutes such as running in place. This will build up endurance.

2. Stretching exercise for neck and lower neck.

3. Abdominal toning exercise such as slow leg raising from a prone position.

4. Arm and shoulder exercise such as pushups from floor, wall or table.

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BIOCHEMISTRY

Find New Evidence Humans Need Vitamin E

➤ "TENTATIVE EVIDENCE" that vitamin E may after all be needed by humans appears in studies by Drs. Alvin Nason and I. R. Lehman of the McCollum-Pratt Institute, Johns Hopkins University, Baltimore.

The vitamin, known chemically as tocopherol, was discovered 30 years ago as a nutritional item needed for reproduction by rats.

Its value for human nutrition has long been debated. It has been generally considered necessary for maintaining the structure and function of muscle, including heart muscle, and the peripheral blood vessel system in a number of animals.

These effects have been laid to its protective action in checking the oxidation of unsaturated fats and other substances sensitive to destruction by oxidation such as vitamins A and C. However, the exact mechanism of the vitamin's primary role in nutrition and whether humans actually do need it had not been determined.

The studies by the Johns Hopkins scientists, reported in *Science* (July 1), suggested that the primary function of the vitamin is to activate a yellow enzyme chemical called cytochrome c reductase. This yellow enzyme plays an important role in oxidation processes involved in energy transfer in cells of the body.

The vitamin may activate the yellow enzyme with the help of some fatty chemical. This possibility, and the behavior of the yellow enzyme in dystrophy muscles of both humans and other animals that are deficient in vitamin E, are now being investigated.

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HOME ECONOMICS

Custom Tailoring Makes Cake Mixes Succeed

➤ CUSTOM-TAILORING of the ingredients is the reason cake and pie mixes succeed while cakes and pies made from scratch in the home kitchen too often fail, Miss Irene Anderson, supervisor of experimental testing at General Mills, Inc., told the meeting of the American Home Economics Association in Minneapolis.

When homemakers make a pie, cake or doughnuts from scratch, they do not buy one kind of shortening for pastry, another for cake and a third for deep-fat frying. That is what is done in the mix business, Miss Anderson said.

The flours used are also especially adapted for each mix, and baking powders are selected which "give tolerance," both in mixing and baking, and have the longest shelf life.

She urged homemakers to follow the directions on the packages. If, for example, the directions for a cake mix call for water and milk is used instead, the result will be a coarse, dry cake.

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EAR-EMITTED SPEECH — Dr. Henry M. Moser, director of the Ohio State University Speech and Hearing Clinic, uses a noise-canceling lip microphone and an ear transducer in studies on speech sounds from the ear.

PHYSIOLOGY

Pilots Soon May Talk Through Their Ears

➤ PILOTS of high-powered and noisy airplanes may talk through their ears, not their mouths, in the future, scientists at Ohio State University foresee.

When background noise is high, understanding of ear-emitted speech is often better than that from the mouth, their studies showed. Severe noisiness reduces intelligibility of any speech, but has less effect on ear-emitted sounds than on mouth-emitted speech.

Drs. Henry M. Moser, John J. Dreher and Herbert J. Oyer recommend designing a special microphone for picking up voice signals from the ear. Several types of microphones and ear seals that isolate sounds from the ear have been used in the tests. (See SNL, Nov. 20, 1954, p. 325.)

The scientists have since learned that in 1935 the late George A. Graham of the Army Signal Corps laboratory at Fort Monmouth, N.J., had noted the emission of speech sounds from the ear, but no extensive research had been done.

The Ohio State studies were part of a research project on voice communication for the Air Force Cambridge Research Center of the Air Research and Development Command in Washington.

Ear-emitted sounds occur naturally, along with mouth-emitted speech. By constructing a soundproofed baffle box to cover the mouth and nose, anyone can produce audible ear-emitted speech, which can be transmitted through stethoscope earpieces.

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AERONAUTICS

Three Jet Types Seen For Airlines of Future

➤ THREE JET engines, the turbo-prop, the by-pass and the conventional jet, will be the major types used by airlines of the future, the president of Trans-Canada Air Lines predicted in Toronto, Canada.

The turboprop, Gordon R. McGregor told SCIENCE SERVICE, would be used for the shorter flights. The by-pass engines would take over medium long-range runs. The conventional jet, such as used in fighters and bombers, would fly intercontinental routes.

By-pass powered planes are not now commercially available, but they have proved promising in tests. For improved fuel efficiency, these engines draw more air into the intake than is needed for fuel combustion. The excess is routed around the combustion chamber into the exhaust. The by-passing air slows down the exhaust gases, making the engine more practical for slower speeds than the regular jet.

Extremely fast planes are senseless for flying short routes, Mr. McGregor said.

"More time is used loading baggage than would be gained by great speed. It does not make that much difference."

For long intercontinental flights the high-thrust jet will probably pay off.

The first stage in this evolution took place in Trans-Canada's fleet with the introduction of Vickers Viscounts, four-engined turboprop planes, which also have been ordered by Capital Airlines in the United States.

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PSYCHOLOGY

Assembly-Line Worker Is Under Great Strain

➤ THE ASSEMBLY line worker, even in a simple job, may be under more of a psychological strain than the man who works alone and performs all the steps in a production process.

This is indicated in research by Dr. Alvin Zander, program director of the University of Michigan's Research Center for Group Dynamics. Dr. Zander is a member of the summer faculty of the University of California at Los Angeles.

In a recent research project at Michigan, Dr. Zander and associates set up two production situations that simulated assembly-line work and that of an individual craftsman. At each worker's foot was an electric button, which he was asked to press whenever he felt the urge to stop work and take a break.

The scientists found that, in the assembly-line situation, workers are very much dependent upon the actions of fellow workers and other factors beyond their control. A crafts worker who does each step in production of an object himself is under less pressure from the group.

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MEDICINE

Get Drunk From Beer?

A Yale psychologist says it is impossible to drink enough beer to get drunk, but many imbibers testify to the contrary in this not-so-sober semantic sally.

➤ "INTOXICATION" FROM beer is impossible, a Yale University psychologist claims. Nonsense, reply beer drinkers who have been "drunk," and a battle of definition is developing over just what is "an intoxicating beverage."

The cork to the controversy was pulled by Dr. Leon A. Greenberg, associate professor of applied psychology at Yale. He said that a person cannot drink enough low-alcohol content beer to become "intoxicated," scientifically.

On the other hand, Dr. Albion Roy King, professor of philosophy at Cornell College, Mt. Vernon, Iowa, said that persons unfamiliar with Dr. Greenberg's "precise mathematical definition of intoxication," can become "tight or . . . drunk" on beer.

A drinker is not intoxicated until his blood shows an alcohol concentration of at least 0.15% and he exhibits abnormal mental and physical actions, Dr. Greenberg believes. He said time is a factor in drinking because the body dissipates the alcohol. He also pointed out that liquid capacity of the human stomach is from one and one-half to two quarts.

Applying this information to distilled spirits containing from 40% to 50% of alcohol, fortified wine with 20%, light wine with 10%, and 3.7% beer, Dr. Greenberg concluded that the first three are intoxicating beverages but that, by his definition, beer is non-intoxicating.

Citing controlled experiments with drinkers, Dr. Greenberg said that a person who drinks ten ounces of whisky in two hours becomes drunk, scientifically. Drinking one and one-third to one and two-thirds quarts of wine in from two to four hours also produces drunkenness. Three quarts of beer would have to be imbibed within two to three hours to have the same effect on a drinker's actions and blood. Consuming three quarts of beer would make most people ill, not drunk, Dr. Greenberg charged.

"The alcohol content of this beverage," he said, "is so low, and the quantity required to produce intoxication so large, that it may properly be considered a non-intoxicating beverage."

In one experiment, attempts were made to force beer consumption of six bottles per hour for three and one-half hours, totalling almost eight quarts. The drinkers, Dr. Greenberg reported, almost all got sick; only a few became intoxicated, scientifically.

The comments of four specialists on Dr. Greenberg's definition of intoxicating beverages were also included in the *Quarterly Journal of Studies on Alcohol* (June).

One of the experts, Dr. King, said "in popular usage, word meanings are determined not so much by their factual reference as by their emotional connotation." He charged that Dr. Greenberg merely stated what people already know, "that it takes more drinking to get tight on beer than on whisky."

Dr. King, who is the author of the book, "Basic Information on Alcohol," said persuading drinkers that beer is non-intoxicating and at the same time showing that any way of getting drunk is undesirable might have some social value.

"If a genuine hiatus between beer drinkers and whisky drinkers, between brewers and distillers, should come in this country, it might advance the cause of temperance," Dr. King stated.

Dr. Harry M. Tiebout of Greenwich, Conn., a psychiatrist and vice-chairman of the Connecticut Commission on Alcoholism, said, "in the eyes of most beer drinkers such a conclusion (Dr. Greenberg's) is simple nonsense, and those with whom I have spoken say so unanimously. They may know nothing about their blood level or the percentage of alcohol content of the beer they drink, and they care less. What they do know is that they get drunk on beer, using their definition."

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INVENTION

Automatic Parking System Wins Patent

➤ A CONVEYOR system for lifting cars to and from the upper levels of a fully automatic parking garage earned a patent for William Zeckendorf, president of Webb & Knapp, Inc., of New York and Alexander H. McPhee, a consulting engineer of Plandome Heights, N. Y.

The car-lift invention marks the culmination in a series of inventions designed to create fully automatic, multistoried garages for mid-town use. Although the New York building firm is not now constructing the automatic garages, "sooner or later we will get involved in them," Webb and Knapp's chief architect, Ieoh Ming Pei, said.

In operation, a car owner drives his vehicle onto a "receiving station platform," where the car is secured to a dolly. The conveyor then takes the car to an upper level, where it is hoisted above other parked cars on the level and set down in a free space.

The vertical conveyor was awarded patent No. 2,704,609. Patent rights were assigned to Webb & Knapp.

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GENERAL SCIENCE

State Department Finds Spy in the Ointment

➤ THE STATE Department finds itself with a spy in the ointment. Officials in Washington fear that a Hoover Commission intelligence study may aid the Communists and permanently injure the work of U. S. science attaches abroad. (See SNL, July 9, p. 22.)

The Commission recommended that gathering scientific intelligence be taken away from the State Department and given to the Central Intelligence Agency, charging that the State Department was failing to do the job. It also recommended that CIA be given authority to appoint scientific attaches for such work.

No Intention to Spy

It was learned that officials of the State Department are both puzzled and angered at the charges and recommendations. It has never been the intention of the Department's science attaches to engage in spy work, it is contended.

What is particularly irksome to the science staff of the State Department is that a similar charge calling the science attaches spies was made once before, by the French Communists.

In 1950, a study of science and foreign relations was made for the State Department by a group headed by Dr. Lloyd V. Berkner. In their study, the Berkner group recommended the establishment of science attaches in U. S. embassies abroad to help the international flow of scientific and technological information. The Berkner report strongly emphasized that science attaches "should concern themselves only with unclassified and legitimately available classified information."

French Reds Sling Mud

The French Communists jumped on the report and in a brochure addressed to the Western European scientists, the Communists warned them not to be hoodwinked. They said that the U. S. science attaches were really spies.

The State Department did not reply to the attack because it was unfounded. It is pointed out that the job of the science attaches is no different than that of any other foreign service officer. They advise, report and represent, but do not act as cloak-and-dagger men.

What State Department officials now fear is that the Hoover Commission report will lend support to the spy charge made by the Communists. At present, there are four science attaches working abroad. They are stationed at the U. S. embassies in London, Paris, Tokyo and Stockholm.

Science News Letter, July 16, 1955

Condors are master flyers, sometimes soaring to 15,000 feet along the western ridges of the Andes Mountains where many make their home.

SALT FROM THE SEA—Natives of Araure, Venezuela, are shown gathering salt from flats that lie below the level of the sea. Sea water is constantly admitted through a system of canals to a depth of about two and one-half feet, at a rate determined by the evaporation. Salt in the water settles and crystallizes in layers that workers break with their feet, then toss by hand into barges.

AERONAUTICS

Sieve Cuts Jet Noise

➤ A SIEVE-LIKE silencer for jet engines, among the noisiest machines that man has yet devised, may make operation of jet transports from domestic fields more desirable.

The silencer, which can be turned on or off at will by the pilot, changes the low roar of the exhaust to a high pitched hiss. This seems less noisy because much of the sound is transferred beyond the range of human hearing. Pitch is raised by forcing the gases through many tiny holes instead of one large opening.

When the muffler is working, the engine delivers less thrust, but the device is designed so it can be turned on while landing, taking off and idling, and shut off in high flight where noise is less objectionable.

For cruising, the silencer is stowed like sections of a collapsible drinking cup around the tailcone with the nozzle open. For take-off and climb, the device can be extended rearward, exposing the sieve holes.

Penalties in weight, loss of take-off thrust and added gadgetry are involved, but some compromise may reduce the ear-splitting roar of present-day jets.

The experiments on the jet exhaust silencer were reported by John Tyler and George Towle of Pratt & Whitney Aircraft Division of United Aircraft Corporation, East Hartford, Conn.

Screen Muffles Roar

➤ THE EAR-SPLITTING roar, most of which is directed rearward, has also been reduced by a screen placed behind the tail. The thrust loss is prohibitively large for flight, but the screen could be used in airfield operations.

Noise reduction from the screen, Edmund C. Callaghan and Willard D. Coles of the Lewis Flight Propulsion Laboratory reported, largely results from reduced speed of the jet stream.

Screens close to the jet exit lowered the sound level as much as 7.5 decibels, they found, and at optimum position reached a 12 to 14 decibel reduction but noise levels in the forward direction increased.

When placed farther than 12 inches downstream from a 5,000-pound static-thrust jet, some of the test screens produced strong resonant noises themselves, vibrating so vigorously that the finer screens were seriously damaged.

At proper distance, the fine mesh screens were much more effective mufflers than the coarser ones.

The scientists' report, published by the National Advisory Committee for Aeronautics, said the method might be improved by using properly shaped airfoils instead of wires in the screens.

A major advantage of the screen muffler is that it would probably be portable, small and lightweight, the researchers said.

Science News Letter, July 16, 1955

NUTRITION

Army, Navy Men Drink More Pints—of Milk

➤ SERVICEMEN consumed 50,000,000 extra pints of milk during the first five months of a program to increase the use of dairy foods by the Armed Forces.

In March, milk-drinking increased 40% over the same month of last year. Extra amounts of fluid milk are supplied to troop and hospital messes. The U. S. Department of Agriculture pays for a large percentage of this additional milk.

The Agriculture Department would have to buy up the milk as surplus if the Services did not drink it, so it pays the equivalent of the cost of buying, handling and storing an equal amount of surplus milk.

Science News Letter, July 16, 1955

ENTOMOLOGY

Insects Put Bite On U.S. Corn Crop

➤ AN UNDESIRABLE alien, the European corn borer, is putting the bite on corn crops across the nation.

The Department of Agriculture's report on insect pest conditions showed that the European corn borer is out in force from the east coast to South Dakota. Infestation in southwestern counties in Kentucky is highest in five years, with 94% to 100% of corn planted about the first of May being attacked by the borer.

In South Dakota, adult moths are reaching the peak of egg-laying in areas where corn is at its critical stage. Heavy infestation is expected. Damage to early corn is reported from Delaware.

The destructive European corn borer, *Pyrausta nubilalis,* was discovered in the United States in 1917 near Boston. It was brought into the country from Italy or Hungary in a shipment of broomcorn imported for use in a New Bedford broom factory.

Since then, the insect pest has spread over 37 states east of the Rockies. Losses it caused to field corn in 1949 alone were estimated at 314,000,000 bushels.

Grasshopper damage is increasing in Missouri and continues to be a major problem in New Mexico. An outbreak over 30,000 acres of crop and rangelands is reported from Utah.

Among orchard pests, first-brood codling moth activity is declining in most areas, while apple maggot flies and the European red mite are building up.

Science News Letter, July 16, 1955

MEDICINE

Quick, Sure Polio Diagnosis Now Possible

➤ WHETHER OR not a sick child has non-paralytic polio can now be diagnosed without guesswork in a matter of days, Dr. Mary O. Godenne and John T. Riordan of Yale University School of Medicine, New Haven, Conn., reported in the *Journal of the American Medical Association* (July 2).

The quick, no-guesswork diagnosis comes from a new method that combines virus isolation and antibody response tests.

Thanks to the Nobel prize-winning tissue culture method of growing polio viruses developed by Dr. John Enders of Boston and his associates, it is no longer necessary to use live monkeys for testing material from patients suspected of having polio. This former live monkey method was expensive and lengthy.

During a six-month period from July to December, 1954, Dr. Godenne used the new tissue culture method on 96 patients at Grace-New Haven Community Hospital. Included were patients with paralytic polio, meningitis for which no cause could be found, non-paralytic polio and encephalitis, a brain inflammation.

Polio virus was isolated in tissue culture in 90% of the paralytic cases, in 32% of the patients with meningitis and non-paralytic polio, and in three of six patients with encephalitis.

"In 60% of the patients from whom a poliomyelitis virus was obtained, the agent isolated from various sources was recognized and typed within seven days of the time of inoculation of the specimen," Dr. Godenne reported. "By two weeks after inoculation these positive results were available in 88%."

Science News Letter, July 16, 1955

ENGINEERING

Tube Tells How Materials Will Act Under Impact

➤ A BRITTLE straw driven into a tree trunk during a tornado shows how differently materials may act under extreme impact. These difficult-to-determine shock properties, important to designers, can now be easily and quickly learned with a new impact tube developed at New York University, New York.

The instrument, called Zeus II after the Greek god Zeus who held thunderbolts in his hand, exposes the test material to a sudden blow from the shock wave of a simulated explosion. An oscilloscope, somewhat like a television screen, records the specimen's impact "fingerprint."

Pressure behind a bursting diaphragm provides the shock wave in the 14-foot-long steel tube. The onrushing pressure slams against the specimen. This constitutes the impact loading. The force of the impact can be varied by changing the length of the dynamic chamber.

Knowledge of the stress-strain response of metals and other materials is essential in the design of structures subject to sudden loads. These include supersonic aircraft, equipment and buildings that may be under bomb blast, the landing gear of aircraft, even automobile parts that are stamped out.

With the new instrument, the effect of impact can be measured over the entire face of the specimen. The New York University scientists have to date studied the response of aluminum, steel, and titanium alloys.

Dr. George Gerard, assistant director of the University's engineering research division, invented the impact tube. The research is sponsored by the Army's Office of Ordnance Research.

Science News Letter, July 16, 1955

MEDICINE

Better Itch Remedies From Chemical Discovery

➤ DISCOVERY of a chemical basis for itching and a forecast of better itch remedies as a result were announced by Drs. Robert P. Arthur and Walter B. Shelley of the University of Pennsylvania.

Heretofore, the body mechanism for itching has been a riddle. Everyone knows simple physical stimuli that cause sensations of pain, touch, heat and cold. No one, however, has "truly characterized" the stimulus for itching, the scientists said. In other words, no one has known what there is about hives, that makes them itch.

Itching, the scientists found, comes from certain enzyme chemicals released in the body. These chemicals either act directly on nerves or, more likely, act indirectly by synthesizing or releasing an active compound from skin cells.

The itch-starting enzymes are ones that break down proteins. They are specifically those that split a central linkage in peptides to break the peptides into amino acids. The scientists found that itch enzymes from animal tissues are trypsin, chymotrypsin and pancreatin. Those from plants are mucunain, papain, bromelin, ficin and fungal proteinase.

Mucunain, they found, is the itch chemical of the plant, cowhage, whose hairs cause unbearable itching. When very small amounts, termed ultra-microquantities, of this enzyme were introduced into the skin, itching started in five seconds and lasted as long as 30 minutes. The itch was at the place the enzyme was put into the skin. There were no hives or other signs, just the sensation, they said in *Nature* (May 21).

Many of the itch remedies used today that the scientists called "quasi-effective," or seemingly effective, such as anti-histaminics, sulfapyridine and arsenicals, may depend for their results on a partial blocking of the proteinases, or itch enzymes.

More study of enzymes and their action, the scientists said, may "point the way to a truly specific means of temporarily blocking of the proteases and therewith the pruritus (itching)."

Science News Letter, July 16, 1955

IN SCIEN

PSYCHOLOGY

Boredom Prime Cause Of Disrupted Homes

➤ WOMAN'S BOREDOM with homemaking is the primary cause of disrupted homes, Dr. Jennie I. Rowntree, director of the School of Home Economics, University of Washington, Seattle, charged at the meeting of the American Home Economics Association in Minneapolis.

If there are seven stages in the life of man, as Shakespeare wrote, the modern woman, according to Dr. Rowntree, has at least five.

The five are student, paid worker, homemaker, responsible citizen and worker again.

A woman must constantly anticipate the change from one to another of these stages, or roles, and be prepared to play her part accordingly, Dr. Rowntree pointed out.

The solution to women's home-disrupting boredom with the job of homemaking, Dr. Rowntree advised, is to be found in teaching girls that "housework is love made visible" and that family meal hours should be looked on as occasions, "high spots of the day."

Science News Letter, July 16, 1955

DENTISTRY

Drug Aids Dentistry on Cerebral Palsy Victims

➤ THANKS TO the drug mephenesin, most cerebral palsy patients may now have safer and more comfortable dental care, where before there was hazard to both patient and dentist, Dr. Manuel M. Album, Philadelphia dentist, has found.

In the great majority of 109 cases treated before dental surgery with mephenesin, which chemically is 3-ortho-toloxy-1,2-propanediol, the drug produced feelings of well-being and relaxation, and nervousness diminished or disappeared, Dr. Album said in the *Journal of the American Dental Association* (July).

The drug made the patients more comfortable and the dentist's work easier, he found, and operating time could be extended on patients otherwise difficult to treat.

Only 15 of the 109 cerebral palsy patients showed poor relaxation under mephenesin.

Dental care of cerebral palsy patients has always been difficult, Dr. Album said. These patients usually have poor control over mouth or throat muscles. Often they cannot keep the jaw in position for long, but they can close it with the strength of a vise, making the dentist's work both difficult and hazardous. Swallowing is not easy for cerebral palsy patients.

Science News Letter, July 16, 1955

CE FIELDS

BIOCHEMISTRY

Hope Enzymes Can Check Cancer Growth

➤ HOPE THAT it may be possible to control cancer by enzyme chemicals that interfere with vital chemical processes in the cancer cells appears in studies reported by Dr. L. Ledoux of the Chester Beatty Research Institute and the Royal Cancer Hospital, London.

Spontaneous breast cancers in mice, among the most resistant cancers to any drugs, were made to regress, or shrink, by one such enzyme, ribonuclease, Dr. Ledoux reported in *Nature* (July 2).

The check to the cancer growth and its decrease in size was not permanent but lasted for some time after the treatment was stopped. The doses used, Dr. Ledoux points out, were probably not the best that could be found with further study. However, it was not possible to find any toxicity up to fairly high levels of enzyme dosage. The only side effect was loss of hair.

Mice with another kind of cancer which had been transplanted into their bodies were also treated with the enzyme. It checked the growth of this cancer but did not cause any shrinking of the cancer.

The studies are preliminary and far from application to humans, but show that enzymes might some day be the means of controlling cancers even, perhaps, in humans.

Science News Letter, July 16, 1955

INVENTION

Patent Submarine Decoy To Foil Enemy Detection

➤ A SUBMARINE decoy that produces submarine-like sounds to foil detection by the listening enemy has been granted a patent.

The fake miniature submarine can also be used to train sound gear operators in locating the source of underwater noises, without assigning an actual submarine as a target.

The device "may or may not be made self-propelled and thus may simulate a submarine either lying to or underway," according to its inventor, Donald G. Reed of San Diego, Calif. He assigned rights on patent No. 2,710,458 to the Government as represented by the Secretary of the Navy.

The fake submarine is small and compact for easy handling and storage. It can be ejected from torpedo tubes or flare guns while a submarine is underway. The "preferred form" would be self-propelled to increase its similarity to an actual submarine in order to avoid not only detection but possible damage or destruction to the mother submarine during encounters with enemy vessels equipped with sound gear.

The noises the unit produces, resembling those of a submarine, could delude the enemy into concentrating his destructive efforts on the decoy while the ejecting submarine slipped away in another direction.

The sounds are mechanically produced, both in the sonic and supersonic range, simulating "to a high degree" the gear whine characteristics of actual submarines and the thrashing noises made by a submarine's propellers.

Science News Letter, July 16, 1955

INVENTION

Polyethylene Used To Package Sodium

➤ THE RISK in transporting and storing sodium may be solved by the discovery that polyethylene and metallic sodium are mutually inert and non-adhesive.

Ernest R. Corneil of Stamford Centre, Ontario, Canada, found that sodium, encased in polyethylene, can be preserved indefinitely without hazard and without worry about adhesion to the package surface. He was awarded patent No. 2,712,384 and assigned the rights to E. I. du Pont de Nemours and Company of Wilmington, Del.

Science News Letter, July 16, 1955

ENGINEERING

$30 Turns Automobile Into Geiger Counter

➤ WITH ABOUT $30 worth of electronic equipment, an automobile can be turned into a Geiger counter.

Frank C. Strebe of the Atomic Energy Project at the University of California at Los Angeles has assembled such a unit.

The equipment consists of a Geiger-Mueller tube and a few associated components, and can be assembled for approximately $30. An expert technician is required to assemble and install it properly.

Radiation is indicated either by tell-tale clicks on the speaker of the car radio or by the movement of a needle on a dashboard-mounted meter. In normal driving, a motorist would probably listen to the speaker.

In case of atomic warfare, the speaker could be used to receive instructions from civil defense authorities while the meter would warn of radiation.

The unit is designed to detect radiation within a 50-foot radius. Thus it would serve not only to warn occupants of danger but would make a car available for monitoring during atomic emergencies.

In cases of emergency, when a large number of detectors may be needed, there might well be more automobile radios in operation than home radios because the former carry their own power.

Science News Letter, July 16, 1955

NUTRITION

Food Flavor Research To Guide Agriculture

➤ THE FLAVOR that makes a food taste good may be an index to its nourishing quality.

Or, to put it another way, food we enjoy may have in its complex chemical makeup nutrients more suitable to the body's requirements than those in other lots of the same foodstuff that our sense of taste judges poorer in flavor.

Research on flavor in food may lead to new and better methods in plant and animal breeding, as well as in seed selection, insect control and food handling techniques, the Investment Bankers of America meeting in Santa Barbara, Calif., was told by William B. Murphy, president of the Campbell Soup Company.

Flavor of the meat may be improved by genetic study of chickens, and the better flavor characteristics of the improved strain may be found by research to depend on identifiable chemical compounds.

"The identification of these chemicals is a new field," Mr. Murphy stated, "in which little has been done but in which much is now underway. As these flavor components are identified and their nutritional effects become known, we can begin to learn how to develop and control them. When we know what makes the flavor of one chicken better than another, we'll be on our way to developing improved chicken flavors through breeding, through feeding and through better handling of chicken meat to preserve the important good flavors.

"This kind of long-range research may pay off soon, or it may not pay off for years. But we are going to put heavy stress on flavor research because we believe it will have a profound effect on our business."

Science News Letter, July 16, 1955

ICHTHYOLOGY

Apartments Made For Octopuses, Eels

➤ THE JAPANESE are putting up apartment houses for eels and octopuses in the Inland Sea of Japan.

A series of 1,280 hollow concrete blocks, with window-like openings on all sides, are being sunk in the channel between Honshu and Awaji Island in southern Japan to build up fish populations there. The blocks are expected to hinder the current along the bottom and make better feeding and breeding grounds for the bream, perch, bass, sand eels and octopuses that make up the commercial catch in the area.

Nearly $27,000 will be spent on this effort to bring back the fisheries to prewar productivity. The Inland Sea fishing grounds have never fully recovered from wartime over-fishing, the U. S. consul at Kobe said in his report to the U. S. Fish and Wildlife Service.

Science News Letter, July 16, 1955

ENTOMOLOGY

Beat Chiggers and Ticks

New pesticides give effective control over chiggers and ticks. Many would-be outdoorsmen stay front-porch men after encountering these pests.

By HORACE LOFTIN

➤ DAVY CROCKETT feared no b'ar or Injun alive, a fact that has been well re-established lately. But Davy had two enemies that surely caused that outdoorsman much mental and physical anguish.

Neither old Betsey nor the trusty Bowie knife could help him when they attacked. As a matter of fact, until the advent of modern chemical insecticides and repellents, nothing at all was much help against them except persistent scratching for chiggers and patient searching for ticks.

Many a would-be outdoorsman has remained a front-porch man after an initial encounter with chiggers and ticks. They are a subtle refinement over the ants that annoy you while you are picnicking. Chiggers and ticks do not start digging in until after you are back home.

With the current crop of chemical weapons against six- and eight-legged varmints, however, modern Davy Crocketts have an effective arsenal with which to retaliate. There are easily applied repellents for clothes and skin that discourage ticks and actually kill the minute chiggers. Chemical sprays can give reasonably long-term control over them on limited areas, such as infested lawns and golf courses.

Exquisite Itch

Of the two, chiggers, called red bugs down South, cause the most exquisite itching.

The chigger is a juvenile delinquent, its parents being respectable eaters of organic debris only. It is in the larval, or infant, stage that this mite is parasitic on living things.

The adult chigger mite lays her eggs in a humid, shady spot, generally early in the spring. The eggs hatch out into the larval chiggers, which latch on to a variety of hosts ranging from rattlesnakes to birds and man.

After about a three-day feeding, the chigger drops off, sheds its skin and enters the intermediate nymphal stage, in which it feeds harmlessly on decaying organic matter as adults do.

One more molt and it emerges an adult, ready to mate and make hundreds of new, hungry chiggers.

Although a sufferer from them will find it hard to believe, chiggers do not burrow into the skin nor do they suck blood. They attach themselves by their mouthparts to depressions in the skin, usually at the base of a hair. Once settled down, they inject a fluid which breaks down the epidermal cells on which they feed. It is this fluid that causes the intense itching.

An investigator once took more than 4,000 chiggers from one woodchuck.

The best way to avoid chigger bites, of course, is to go where they are not. Chiggers make their homes mostly in low, damp places well shaded by vegetation. The margins of streams and lakes, shady woods, tall grass and berry patches are favorite hangouts.

They do, however, frequently make themselves pests in relatively dry spots like golf courses, parks and lawns.

For individual protection, "repellents," which actually kill the tiny chiggers, containing dimethyl phthalate, dimethyl carbate, indalone or ethyl hexanediol are nearly 100% effective when used properly. They also repel mosquitoes, gnats, black flies and other biting flies.

Smearing the repellent only on the socks above the shoe tops and on the bottoms of trouser legs will keep you reasonably free from chiggers. If you apply the chemicals to all the openings of your clothes—neck band, shirt fly and cuffs, inside waist band, fly and cuffs of trousers, socks above the shoes and under the shoe tongue—you will just about shut out the chiggers completely.

You can chigger-proof your field clothes by dousing them in a solution of the above repellents, or preferably benzyl benzoate, dissolved in cleaning fluid. It takes about two ounces of chemical to treat a jacket, trousers and socks of medium size. The repellent should be dissolved in about one and a half quarts of cleaning fluid.

Long-Lasting Protection

After the clothes are saturated with the solution, the cleaning fluid evaporates, leaving them impregnated with the repellent. If you avoid wetting your field clothes after such treatment, chiggers will be repelled for several days.

For control of chiggers in open areas such as lawns, toxaphene and chlordane, two pounds to the acre applied as an emulsion spray, will give good results for one to two months.

While some species of ticks are occasional spreaders of Rocky Mountain spotted fever

UNWANTED GUEST—Ticks, such as this American dog tick, and their tiny cousins, the chiggers, can make life miserable for outdoorsmen. Ticks feed on blood, while chiggers break down epidermal cells to suck. Easily used chemicals are now available for protection from them.

and tularemia (rabbit fever), it is their nasty bite and nuisance value that makes them generally abhorred. Humans are lucky; we can pull off our tick guests. Wild animals are not so fortunate, and a severe tick infestation can cause anemia leading to death.

One dying hare was discovered with a hemoglobin reading of only 20%; there were 152 gorged ticks feeding on it. Domestic rabbits may be practically bled dry with as few as 60 to 75 female ticks feeding on them for about 12 days.

Control Ticks

In general, none of the repellents and insecticides now considered safe for public use will give the same high degree of control over ticks as they do for their smaller cousins, the chiggers. However, several of them offer considerable protection against the common species.

Application of repellents to the skin is of little use against ticks. Best use of repellents, such as dimethyl phthalate, ethyl hexanediol and indalone, is as clothing impregnants. Placing repellents around the openings of clothes helps a lot. Most satisfactory, though, is saturating field clothes with repellent. This method gives about 75% protection from ticks.

For area control of ticks, the chlorinated hydrocarbon insecticides such as DDT, chlordane, toxaphene and dieldrin are effective. Application in emulsion form of one to two pounds per acre will give good control within a few days and will prevent reinfestation for about a month.

May Enter House

While ticks seldom infest human habitations, they may be brought into the house on clothing or by pets. If large numbers are found in a house, they are probably brown dog ticks.

This tick can pass its entire life cycle indoors if dogs are kept in the house, but it rarely attacks humans. Commercial formulations containing DDT, chlordane or lindane, or combinations of them, afford control of house-infesting ticks.

Long before these modern insecticides and repellents were dreamed up, old Mother Nature had started her own chemical control on a limited basis. It is fairly well established that some animals and persons have a natural "aroma" that repels ticks.

One scientist has reported the case of a Missourian who actually killed some unattached ticks that were kept close to his skin for about 20 minutes.

Await Victims

While it is the larval form of the chigger mite that attacks man, the adult common tick causes the most trouble.

When the adult is ready to feed, it climbs up on grass or other vegetation, clinging to its perch with the third legs and waving the others about, ready to grasp any hapless passerby.

Once the tick finds a mammalian host, it settles down for a blood meal of several days' length. When the appetite for food is slaked, it prowls about over the host looking for a member of the opposite sex. Mating occurs on the host animal.

Feed on Blood

The male continues to feed for an indefinite time. After mating, however, the female gorges more blood for a short while, then drops to the ground to lay her eggs—about 4,000 to 6,500 at the rate of 800 a day for a common American species.

There are two stages in the tick's life cycle before adulthood. In both of these stages the young tick feeds from mammalian blood. Luckily for humans, these "seed ticks" show a marked preference for such small hosts as meadow mice and rabbits, and we are left to worry mainly over the adults.

How long can a tick sit around and wait for a meal to come to him? Some figures on tick longevity are startling. In one experiment on the American dog tick, unfed adults were kept alive for 1,032 days. Another tick, *Ornithodorus turcata,* found in a limited area of the West, was kept for nine years without a blood meal and then for an additional three and a half years after feeding.

Ticks and chiggers have inspired a lot of words from nature lovers, mostly unprintable. One poet, surely following a sleepless night after a day in the fields, left the following message:

There is a little chigger
And he isn't any bigger
Than the point of a very small pin;
But the bump that he raises
Itches like blazes
And that's where the rub comes in.

Science News Letter, July 16, 1955

VITAL STATISTICS

Death Rates Fall In Western Europe

➤ NEW LOW death rates have been established in Western Europe during the postwar period, statisticians of the Metropolitan Life Insurance Company reported in New York.

Western Europe's general health, gauged by mortality and disease rates as well as by life expectation, is better than ever before, they found, despite the relatively short period since the widespread lack of food, clothing, shelter and medical services during World War II.

The death rate in France, for example, fell from 13.5 per 1,000 in 1946 to 11.9 in 1954, compared with 15 per 1,000 in the immediate prewar period. In Italy the death rate was reduced from 12.1 to 9.0 per 1,000 between 1946 and 1954, compared with an average of about 14 per 1,000 in 1937-1939.

New low death rates were found for Austria, Belgium, Denmark, western Germany, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, England and Wales, and Finland. Many of these countries also reported new records for expectation of life.

The postwar health record of Western Europe may partially reflect the weeding out of impaired lives during the war. But it has resulted mainly from such activities as the restoration, soon after the war, of medical, hospital and public health services, and subsequent expansion and improvement of these services.

"Further decreases in mortality may be expected in Western Europe as the general standard of living continues to rise," the statisticians said.

Science News Letter, July 16, 1955

How to Be Incredibly Cool This Summer

Arthur Carson's *How to Keep Cool* describes practically every *fast, low cost, scientifically right* way known so you can cool off fast, and stay cool all summer long. With this book to guide you, there's simply no excuse any longer for sleepless nights or nerve-wracked days when you just can't bear the heat any longer.

Whole sections of this 30,000 word book tell you how to get the benefits of air conditioning without all the cost. Now, for perhaps the first time in your life, you learn the scientific ways to cool a single room or an entire house with low cost electric fans. (From now on, forget your old belief that fans are good only to chill you and give you a bad cold and a stiff neck.)

There's full information on the many easy, inexpensive, practical things you can do inside and outside your home to bring sea breeze comfort without drafts. How a $15 job in your insulation-less attic can change your bedroom from an even to an airy, comfortable place on the hottest nights. Why Venetian blinds offer little practical protection from the heat and what is much, much cooler.

You learn how to get the last bit of use out of attic fans, dehumidifiers, the new low cost evaporative coolers (much less expensive than air conditioners and better if you live in the right part of the U. S. for their use), the different kinds of air conditioners, and how to make a low cost installation do the job of a more expensive one.

For your personal comfort, you get the answers to the questions you've been asking for years. Which is better—a cold shower or a warm bath? (You think you know that one? Better read what the scientists have to say. The right answer will be a blessing when you come in out of a hot street this summer.) When the thermometer is climbing, is it really dangerous to drink ice water? Is hot coffee or hot soup wiser? Look at the Arab with all his heavy clothing and ask, "Is it true that the fewer, lighter-weight clothes you wear, the cooler you are?"

Don't spend one cent on an air-conditioner until you know how large a unit you really need! Too small a unit won't give you the comfort you wish. Too large a unit means spending unnecessary money. *How to Keep Cool* tells you exactly the size unit you need for your own home or office—or whether you need one at all.

This summer, be cool on the hottest days. *How to Keep Cool* costs only $1—how small a sum that is on a day when you'd give anything to get cool! So order it now.

Print name & address, tear out ad, and mail with $1 to HARIAN PUBLICATIONS, 5 CROWN BLVD., GREENLAWN (LONG ISLAND), N. Y.

• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE A.R.R.L. ANTENNA BOOK — *American Radio Relay League*, 7th ed., 344 p., illus., paper, $2.00 plus postage. For the radio "ham."

FIVE HUNDRED ANSWERS TO BEE QUESTIONS: Pertaining to Bee Behavior, Colony Management, Products of Bees, and Handling and Marketing of Honey—Walter Barth—*A. I. Root Company*, 3d ed., 96 p., illus., paper, 95 cents. Useful information for beekeepers.

GENERAL PRINCIPLES OF GEOLOGY — J. F. Kirkaldy—*Philosophical Library*, 327 p., illus., $6.00. Providing a balanced introduction to this science.

GETTING THE MOST FROM RESEARCH AND ENGINEERING: With a Section on New Product Development—Robert M. Bowie and others—*American Management Association*, Manufacturing Series, Number 217, 59 p., illus., paper, $1.75. Discussing important problems of administration and organization.

HOW TO BUILD PATIOS, TERRACES, BARBECUES, WALKS, FENCES, AWNINGS, GATES—Louis Hochman—*Arco*, 144 p., illus., $2.00. Ideas and directions for the do-it-yourself enthusiast.

HOW TO RECOGNIZE AND HANDLE ABNORMAL PEOPLE: A Manual for the Police Officer — Robert A. Matthews and Loyd W. Rowland — *National Association for Mental Health*, 48 p., illus., paper, 65 cents. Intended for police officers, this booklet is good reading for anyone, since anyone is likely some day to meet and have to handle a person who is mentally ill.

MACHINES OF PLENTY: Pioneering in American Agriculture—Stewart H. Holbrook—*Macmillan*, 246 p., illus., $4.00. A readable book about the contributions of individuals to the modernization of agriculture.

MERCHANT SHIPS—WORLD BUILT: Vessels of 1000 Tons Gross and Over Completed in 1954 —Compiled by Publishers with an introduction by A. C. Hardy—*Adlard Coles (John de Graff)*, 263 p., illus., $5.00. Reporting for ship enthusiasts ships actually completed. West Germany has become the second largest shipbuilder in the world.

PROCEEDINGS OF THE EIGHTH ANNUAL CONFERENCE ON THE ADMINISTRATION OF RESEARCH —Paul R. Beall, Chairman of Program Committee—*New York University Press*, 108 p., illus., paper, $4.00. The task of running a research laboratory these days may be all tangled up with questions of security and clearance.

SAFETY IN THE HOME WORKSHOP—*Popular Mechanics Press*, 15 p., illus., paper, 10 cents. To help prevent the do-it-yourself hobbyist from doing himself harm.

SCIENCE TEACHING IDEAS II — Abraham Raskin, Ed.—*National Science Teachers Association*, 47 p., illus., paper, $1.00. Science teachers exchange ideas.

THE UNDERWATER NATURALIST—Pierre de Latil, translated from the French by Edward Fitzgerald — *Houghton Mifflin*, 275 p., illus., $3.50. The author as a boy wanted a book about the fish he caught at Cap d'Antibes. He never could find such a book so now he has written it. Beautifully illustrated with underwater photographs.

VEHICLE CLIMBING LANES—T. S. Huff and others — *Highway Research Board*, Bulletin 104, 31 p., illus., paper, 60 cents. Providing a separate lane for the truck slowly chugging uphill reduces a traffic hazard for other drivers. (See SNL, July 9, p. 21.)

Science News Letter, July 16, 1955

• RADIO

Saturday, July 23, 1955, 5:00-5:15 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Jerome Namias, chief of extended forecast section, U. S. Weather Bureau, will discuss "Long-range Weather Forecasting."

ENTOMOLOGY

Termites Eat Out Homes On Pitcairn Island

▶ TERMITES, ORIGINALLY housed in a church organ sent by a well-wisher, are eating Pitcairn Islanders out of their homes.

Pitcairn Island is the historic home of the Bounty Mutineers.

The organ was sent to the islanders, a Seventh Day Adventist community, from New Zealand. The termites it contained were previously unknown on the island.

Pastor N. A. Ferris, who recently spent two years on the island, said "the termites are literally eating the islanders out of house and home. Nothing can be done to combat their ravages."

Mr. Ferris, who has spent 28 years in missionary work in the Pacific Islands, said Pitcairners were congenial and hospitable people. They are descendants of Fletcher Christian and the Bounty mutineers who settled there in 1790.

Science News Letter, July 16, 1955

The cause of *multiple sclerosis*, a disease of young adults, is as elusive now as it was in 1835 when the disease was first observed and described.

BOTANY

Control Leaf Falling

▶ A PLANT growth hormone called auxin controls the shedding of leaves in the fall and the dropping of fruit when it is ripe.

This theory, of considerable practical significance to agriculture, was suggested by Drs. Fredrick Addicott, R. S. Lynch and H. R. Carns of the botany department at the University of California at Los Angeles.

Experiments have shown that when auxin content is higher in the leaf than in the stem, a condition characteristic of healthy, mature plants, the leaf remains firmly attached to the plant.

When the leaf ages, the growth hormone becomes equally distributed between leaf and stem, and the leaf is ready to fall. A higher auxin level in the stem accelerates defoliation. The same auxin mechanism regulates fruit drop, according to the scientists.

Dr. Addicott and his associates have been able to accelerate leaf fall in cotton and beans by applying the growth hormone to the stem. This suggests an important application in improving techniques of defoliating cotton for machine harvesting, as well as in improving methods of regulating fruit drop.

Science News Letter, July 16, 1955

Chickens have no sweat glands.

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"The entire process of reproduction, together with the attitudes inculcated by tradition, education, and social standards, is described clearly for children and younger adolescents."—Science News Letter.

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HORTICULTURE

Put Roses on Liquid Diet For Health and Beauty

➤ A STEADY liquid diet is best for roses if you want healthier plants and more beautiful blossoms.

Dr. Harry Kohl of the University of California at Los Angeles said that studies have shown that roses, cymbidium orchids and carnations thrive on such a diet.

The liquid diet is prepared as follows: A concentrate is made consisting of three pounds of potassium nitrate, five pounds of ammonium nitrate and 12 pounds of calcium nitrate in 10 gallons of water. One gallon of the concentrate is added to every 400 gallons of water. Proportioners that attach to a water hose may be obtained commercially to dole the concentrate out automatically.

The "meal" should be "served" the flowers every time they are watered, Dr. Kohl said. This insures adequate nutrients for plants, furnishes an even concentration and automatically times "feeding." When plants need more water, as they often do in the summer, they also need additional food.

Science News Letter, July 16, 1955

VETERINARY MEDICINE

Contented Cow No Joke: Bossy Really Smiles

➤ HAPPY AND contented cows will always smile, according to Dr. W. E. Petersen, dairy expert at the University of Minnesota, who is visiting West Australia on behalf of the Australian Dairy Board.

Dr. Petersen, a world authority on dairy cow psychology and milking practices, said a cow's smile is not like a human's smile, but it is a smile just the same.

Human smiles are indicated by contraction of the facial muscles. The cow smiles when she cocks her ears forward and her eyes brighten.

Dr. Petersen said there was every counterpart of human behavior in the cow herd —good, bad and indifferent. His definition of "cow psychology" is understanding how cows react to humans and how they behave within their own society.

Dr. Petersen's work has been largely devoted to studying how care of dairy cattle affects their milk production.

Science News Letter, July 16, 1955

ENGINEERING

Computer Simulates Any Weather Conditions

➤ A FIVE-FOOT electronic "brain" that can simulate an igloo in the Arctic or a thatched-roof hut in Africa has been unveiled.

Developed to analyze any kind of weather, the "house analog," as it is called, reproduces the heat characteristics of a house while surrounding the building with any type of weather conditions desired. Research scientists of the Minneapolis-Honeywell Regulator Company, who made the computer, expect it to shorten heating, air-conditioning and building-material studies by as much as five years.

In operation, the device is fed pre-determined information about the house, such as storm windows, construction details and insulation, as well as weather conditions. One second of the analog's time is equivalent to 60 days of actual time, which means that it can compute a house's complete life-span in a matter of minutes.

"The house analog," explained Dr. Finn Larsen, Honneywell research director, "can, in effect, make weather stand still. Previously, we have had to wait for the right weather conditions to come along, perhaps months or even years, and even then the desired conditions might prevail only briefly."

The device stands five feet high and is two feet by one and one-half feet wide and is primarily concerned with measuring heat losses and gains. During an actual test, simulated storm windows, the type of insulation or other factors can be changed, by turning appropriate knobs.

Science News Letter, July 16, 1955

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AGRICULTURE

Farm Ponds Yield Livestock Feed

➤ ARTIFICIAL PONDS may soon furnish high-quality livestock food in abundance. They are now a boon in irrigation and an extra source of proteins in the form of fish.

Experiments at Kansas State College showed that the common pond weed, *Elodea canadensis*, is equal or superior to alfalfa meal as a part of a pig-fattening diet.

Elodea, the moss-like weed in most American goldfish bowls, yielded from 12 to 14 tons green weight to the acre in a Kansas pond. It replaced itself in three months.

Sixteen weanling pigs gained 1.75 pounds a day when fed a balanced ration with elodea meal substituted for alfalfa meal in the mixture. They gained 1.57 pounds a day with the alfalfa portion.

To be used, elodea must be dehydrated. The meal resembles alfalfa meal, but is darker and less dusty. It has a faint fishy smell.

Science News Letter, July 16, 1955

VETERINARY MEDICINE

Insecticide Dip Harmful to Pets

➤ DOG OWNERS should beware of using the insecticide chlorthion on their pets, a team of scientists from the A & M College of Texas has warned.

Testing the effects of insecticides on the animals, Dr. R. R. Bell, M. A. Price, and Dr. R. D. Turk found that chlorthion has a relatively high toxicity to dogs and "is not safe to apply to the animal body."

They found, however, that malathon, used either orally or applied as a dip, has a low toxicity for dogs. Even when given very strong doses of malathon orally, the dogs studied showed no apparent signs of toxicity. The scientists cautioned that more work is necessary with malathon, however, before final conclusions on its effects can be drawn.

Their investigations were reported in the *Journal of the American Veterinary Medical Association* (April).

Science News Letter, July 16, 1955

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ENTOMOLOGY

NATURE RAMBLINGS

"Flying Ants"

➤ ARE THOSE "flying ants" shimmering about your yard this summer really ants? They could be termites, you know.

Here is how to tell:

Take a look at the wings. If they are ants, one of the pairs of wings will be shorter than the other, and the longest pair of wings will only be about a third of the length of the body.

Termites, on the other hand, have two pairs of wings of about equal length, which average twice the length of the insects' body. When you spot those long wings, it is time to call the exterminator.

Another clue to telling ants and termites apart is that ants have narrow waists, like the wasps. Termites have a middle-aged look about them, being about equal thickness throughout the body. You can use this test when the insects have lost their wings.

It is the mating instinct that sends ants and termites into the air. Ants mate during the "nuptial" flight, the males dying shortly afterwards. The fertilized female ant settles to the ground, bites off her wings and digs a shallow nest where she deposits the first eggs of her future colony.

Termites are not so impetuous. They merely pair off during the flight, to start building a burrow for their future home. They do not usually mate until this honeymoon cottage is completed.

Both male and female termites lose their wings spontaneously or knock them off against some hard object. They do not bite off their wings as ants do.

Nobody has a kind word for termites, because of their choice of food — wood. Too often the wood they choose is the underpinning of a house, or a favorite piece of furniture.

Actually, the termites cannot digest their meal of wood without help. Certain bacteria living in their intestinal tract break down the wood into a form that they can use. Without these bacteria, they would starve to death—even though they were offered the tenderest and most delicious door sill in your house.

Science News Letter, July 16, 1955

MEDICINE

Cortisone Aids Paralysis Sufferers

➤ SUFFERERS FROM cerebral blood clots causing semi-paralysis and spastic muscles may have a better chance for comfort and better physical therapy with the use of cortisone and hydrocortisone.

Following use of these chemicals, a marked decrease in painful spasticity in four hemiplagia patients was noted, and the muscles were more pliable and flexible. So reported a team consisting of Drs. R. F. Sheely, C. H. Johnson, J. J. Baker, and Rodney Harbaugh, physical therapist, of the Annie Warner Hospital, Gettysburg, Pa., in the *Journal of the American Medical Association* (July 9).

In general, the psychomotor stimulation, the increased sense of well-being and the pain-relieving effects of hydrocortisone and cortisone proved a definite aid in progressive response to physical therapeutic measures for the patients, they found.

Science News Letter, July 16, 1955

PATHOLOGY

Radioactive Bodies Are Autopsy Hazard

➤ PERFORMING AUTOPSIES on bodies of patients who have been treated with radioactive materials poses a grave risk to pathologists in this atomic age, two radiation experts of the Veterans Administration Hospital, Hines, Ill., have warned.

The "greatest hazard" arises when no one is aware of the body's radioactivity, Drs. Ervin Kaplan and Theodore Fields said. Medical men will have to take the same precautions other scientists observe in handling radioactive substances.

Doctors are using radioactive materials on an increasingly wider scale in diagnosis and treatment. Various radioisotopes are used in tracer studies to locate diseased parts of the body and in the treatment of such conditions as cancer, heart disease, thyroid trouble and blood disorders.

Where radiation levels are relatively high, from five to 30 millicuries (a unit measuring radioactivity), a safety officer should be present to prescribe the working time at various distances from the body. In his absence, Drs. Kaplan and Fields suggested the wearing of heavy rubber gloves "of double thickness with gauntlet tops" to minimize exposure during autopsy.

They also advised a plastic apron, plastic shoe covers and special glasses.

When the patient's body contains more than 30 millicuries of radioactivity, a chart should be posted on the room door stating the date, amount and identity of the isotope given. It is "mandatory" that a safety officer prescribe the working limits, the two doctors said in the *American Journal of Clinical Pathology* (June).

Science News Letter, July 16, 1955

Debeaking *turkeys* reduces losses from cannibalism.

METEOROLOGY

Brace for July Heat

➤ A JULY hotter-than-normal was forecast by the U. S. Weather Bureau for the eastern half of the United States. In the northeastern quarter of the country thermometer readings are expected to be especially higher than usual.

The Southeast and the region along the Gulf Coast will be excepted from the above normal temperatures in the eastern half of the nation, the Weather Bureau predicted.

Below normal temperatures are expected in the Northern Plains and west of the Continental Divide, with the greatest departures below usual seasonal temperatures in inter-mountain areas. In unspecified areas, temperatures will be near normal, the weathermen predicted.

Precipitation, they forecast, will exceed normal over most of the western half of the country, in the upper Mississippi Valley and in the extreme Southeast. Subnormal amounts are expected in a broad zone extending from the middle Atlantic states southwestward to northern Alabama and Mississippi. Elsewhere near normal rainfall is predicted.

Sprawl on Ground

➤ ONE WAY to beat the heat these hot stuffy evenings is to sprawl out on the ground outdoors. The coolest layer of air is close to the ground during a calm night, tests reported in Nature (July 2) showed.

A temperature profile of the air from the ground up, made using sensitive thermometers, showed that the temperature dropped sharply for the first two and a half inches, then rose again gradually at higher levels. When not disturbed by winds, the temperature differences became more pronounced with time.

The findings, although made during the winter, apply to warm weather too. The data throw new light on frost, which strikes California, Arizona and Florida winter crops three to four times a year.

The study contradicts the classical theory of air layers near the ground, which holds that the cooling is a direct consequence of heat loss to the ground by tiny heat currents and direct contact.

The work, reported by J. V. Lake of the University of Reading Horticultural Laboratories in England, supports the view that heat transfer by radiation is the important factor.

Spring Fever Helps

➤ IF HOT summer days are rough on you, be thankful you had a good case of spring fever earlier. For without this body "tune-up" for climate change, you really would be suffering.

During the first hot days of the season, the body adds water to the blood stream in an effort to keep cool, Dr. Morton J. Rodman of Rutgers University's College of Pharmacy, Newark, N. J., reported. At-first there is not time to add enough red blood cells to establish a normal balance, so the blood is thin. You have spring fever.

In time for summer, however, the balance between blood cells and plasma is achieved, and the blood vessels become enlarged to take on additional moisture. This permits more efficient working of the sweat glands, which is the body's mechanism for getting rid of heat.

Science News Letter, July 16, 1955

BACTERIOLOGY

Mysterious Germ Killer

➤ A MYSTERIOUS substance found normally in the digestive system, in tears and saliva, and in eggs may become a new weapon against disease.

Discovered by the late Sir Alexander Fleming, who also gave the world penicillin, the substance is called lysozyme. It is the subject of intensive research by Dr. Stanley E. Hartsell, a bacteriology professor at Purdue University.

Prof. Hartsell has found that lysozyme, which eats the cell walls of germs, is a good germ-killer. But in combination with certain enzymes, it works even better. With trypsin, for instance, lysozyme destroys every type of bacterium exposed to it so far in the Purdue bacteriological laboratories.

This "synergism" suggests that the team of lysozyme and trypsin could be used to digest parts of bacterial cells. Then these fractions might be used to prepare immune substances to give the body additional protection against disease.

Another possible use interests medical researchers, who have been following Dr. Hartsell's work. They find with his methods that 400 to 600 units of lysozyme exist in the lower part of the normal human digestive system. But in people with peptic ulcer or ulcerative colitis, two painful and serious conditions, the lysozyme units soar, reaching as high as several million.

Medical men wonder if the destructive habits of lysozyme might contribute in some way to ulceration in humans. This field of study may ultimately lead to anti-lysozyme preparations to bring relief to thousands of sufferers from ulcerative conditions.

Science News Letter, July 16, 1955

Termites attack wood fiber.

Questions

AERONAUTICS—What three types of jet planes may be used in the future? p. 37.

How can noise from jet planes be reduced? p. 39.

□□□

ANIMAL PHYSIOLOGY — Why are sheep wakeful? p. 36.

□□□

BIOCHEMISTRY—What is believed to be the function of vitamin E? p. 37.

□□□

ENTOMOLOGY—How does the chigger cause itching? p. 42.

□□□

MEDICINE—How much alcohol must be in a person's blood before he is intoxicated? p. 38

What discovery may lead to better itch remedies? p. 40.

□□□

Photographs: Cover, General Electric Company; p. 35, Gaynor and Company, Inc.; p. 37, Ohio State University; p. 39, Hamilton Wright; p. 42, Fremont Davis; p. 48, Bakelite Company.

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• New Machines and Gadgets •

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RAY GUN with new television set permits viewer, without getting out of his chair, to change channels, turn the set on or off, or cut off the sound. The viewer simply "shoots" a ray of light at the set's controls, which are photo-cell chambers that can be adjusted so that ordinary lighting does not act on them. The controls are set at opposite corners of the TV screen to make them easy targets.

Science News Letter, July 16, 1955

STEREO CAMERA, for medical research work, permits the photographer to take undistorted 3-D pictures of extremely close objects. On the 35 mm camera, adjustable prisms are mounted in front of two lenses, enabling the camera's "eyes" to converge as human eyes do when viewing a close object. (See SNL, July 9, p. 25.)

Science News Letter, July 16, 1955

AUTOMATIC BRAKE eliminates the conventional foot pedal by operating through the accelerator pedal as the operator relaxes pressure on it. The new power brake operates in the top three-quarters of an inch of a specially adjusted accelerator pedal. The manufacturer claims drivers, once used to the device, can safely stop automatically braked cars in much shorter distances than cars with conventional brakes.

Science News Letter, July 16, 1955

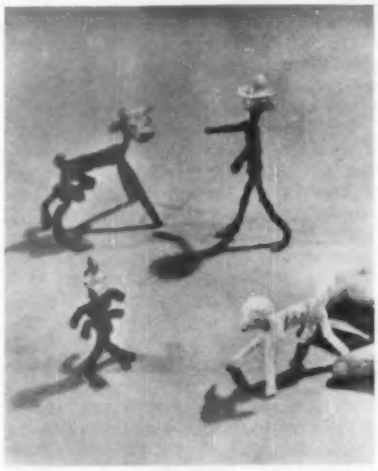

FIGURE KITS, containing colored pipe cleaners and plastic animal heads, have all the makings for constructing a wire menagerie. There is even a shaggy dog in the dog kit, and the farm group, shown in the photograph, includes a cow, a chicken and a lamb, and a farmer to tend them. Mounted cowboy and Indian battle it out in the western kit, and the cat kit has kittens of four different hues.

Science News Letter, July 16, 1955

SWITCH-LESS LAMP is turned on or off merely by touching its base, which contains a sensitive electronic control device. No pressure, only a touch, is needed to activate the mechanism. The portable lamps with the new control will be available in the fall.

Science News Letter, July 16, 1955

WINDOW GLASS lets only 12.5% of the outside brightness into building interiors. Designed to eliminate glare discomfort in classrooms and offices, the glass permits viewing the outside without color distortion.

Science News Letter, July 16, 1955

SCREW FEEDER automatically supplies screws, one after another, in screwing position at the head of the power screwdriver to which it is attached. The device has enabled factory workers to speed up screw-fastening operations from 50% to 400%.

Science News Letter, July 16, 1955

STYLUS-LESS STENCIL, for duplicating use, is prepared with an artist's brush and special ink, instead of the stylus gadgets formerly used. The brush feature permits the easy preparation and reproduction of small posters, signs, maps, charts, etc.

Science News Letter, July 16, 1955

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Do You Know?

There were 845,116 *fires* in urban areas of the United States in 1954.

A Government collection of half a million *fungus* specimens helps scientists identify and study the destructive growths.

A modern *jet* fighter sucks 132,000 cubic feet of air into its turbines every minute of flight.

Color television sets contain more than twice as many parts as typical black-and-white sets and take three times as long to assemble and test before leaving the factory.

Milk standing in a clear glass container on a sunny window sill or doorstep loses riboflavin and may develop a "sunlight" off-flavor in as brief a time as half an hour.

An aluminum reflector lens 79 inches in diameter is now ready for use in Japan's first solar heat furnace, which is designed to generate temperatures up to 5,000 degrees centigrade for manufacturing *synthetic gems.*